ABSTRACTS

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ABSTRACTS

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1. Transcriptome Profiling Associated to Plant Diseases: A Review

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ABSTRACT : Transcriptome profiling involves estimation of transcript's relative abundance and focuses on differentially expressed genes among various groups, which helps in identification of potential genes responsible for susceptible and resistant reaction of plant diseases. The transcriptome study enriches knowledge on host-pathogen interaction and also discloses the crucial biochemical pathways involved in defense mechanism of plants against various diseases.

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2. Concurrent Change in Photosynthetic Parameters in Kinnow Leaves under Integrated Nutrient Application

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ABSTRACT : Seasonal changes in photosynthetic characteristics, relative water content, canopy volume, leaf nutrient content in Kinnow leaves in response to integrated nutrient sources were investigated in Jhalawar district of South Eastern Rajasthan state of India during 2012-13. Interaction effect of nitrogen and vermicompost were significantly superior over other treatments in terms of better photosynthetic efficiency parameters of Kinnow mandarin plants during gestation period of 3 years age *viz.* photosynthesis rate, transpiration rate, stomatal conductance, photosynthetic active radiation, internal CO_2 concentration, vapour pressure deficit, leaf temperature, relative humidity. Out of all treatment combinations, T_{15} (nitrogen @ 350 g/plant + vermicompost @ 20 kg/plant) proved significantly superior over most of treatment combinations including control in photosynthetic efficiency parameters of Kinnow mandarin plants. The photosynthetic efficiency of Kinnow mandarin plants was found maximum under T_{15} (6.97) treatment. The better stomatal conductance, transpiration rate, relative humidity percentage of leaves, internal CO_2 concentration and leaf temperature attained optimal values at higher PAR. The application of 350 g nitrogen along with 20 kg vermicompost per plant in two split doses in Kinnow mandarin at gestation phase may improve the plant growth, developmental and photosynthetic efficiency parameters which are pre-requisite for strong framework and higher yield along with improvement in the soil health. In order to define P_n of the tree, it is necessary to consider not only photosynthetic response of the single leaf but also the overall canopy structure (leaf area index, total leaf area, leaf orientation towards radiation flux) which varies considerably according to environmental conditions. The canopy structure influences the overall P_n of the tree. Further studies on the carbon balance in relation to nutrition may contribute to growth and developmental improvement in the plants.

Published in : HortFlora Research Spectrum, 5 (1) : 7-11 (March 2016)

3. Effect of Growth Regulators on Shoot Maturity, Flower Induction and Yield of Litchi cv Shahi

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ABSTRACT : A field experiment was conducted to induce the flowering in litchi through growth regulators in 8-9 years old litchi orchard (junior bearing stage) consecutively for 2 years comprising of 12 treatments of four PGRs *i.e.* GA_3 (25, 50, 75 ppm), Ethrel (100, 150 ppm), NAA (15, 25, 40 ppm), MH (15, 20, 25 ppm) and control (water spray) with three replications. Three spraying of NAA, Ethrel, MH along with control and two spraying of GA_3 was applied at pre flowering stage from 1st week of October at 30 days interval, while 3rd spraying of GA_3 was given after fruit set. Data revealed that PGRs treated plants showed comparatively lesser twig length, number of leaflet/twig, twig length and twig diameter ratio, leaflet and twig diameter ratio and more twig diameter, emergence of pure panicle and fruit yield than control (without treated plant). Plant treated with Ethrel @ 100 and 150 ppm expressed significantly higher number of pure panicle emergence (86.67 and 91.67%, respectively) and fruit yield (53.33 and 52.50 kg/plant, respectively) than other treatments. Relationship of pure panicle with fruit yield showed positive and moderately strong correlation ($r = 0.71$, $R^2 = 0.51$).

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4. Variability Study in Bael (*Aegle marmelos Correa.*) Genotypes

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ABSTRACT : Genetic variability and correlation coefficient were studied in fifty genotypes of bael fruit at Horticulture Reasearch Centre and laboratory of the Department of Horticulture, SVPUA&T, Meerut in two consecutive years *i.e.,* 2013-14 and 2014-15. Data were recorded on 16 morphological and qualitative traits. Invariably commercially released cultivars *viz.,* Pant Shivani, Pant Aparna, Pant Sujata along with genotypes VB-28 and VB-23 exhibited higher yield and yield contributing traits. High values of GCV and PCV were observed for yield per tree, fruit pulp weight, fruit weight, seed weight, number of fruits per tree, ascorbic acid, skull weight, and reducing sugar. High heritability (in broad sense) along with high estimates of genetic advance (% of mean) was observed for almost all the characters viz. yield per tree, fruit weight, fruit pulp weight, skull weight, seed weight per fruit, T.S.S., ascorbic acid and total sugar. The present study also revealed the presence of great amount of genetic variability which offers bright prospects for its improvement in near future.

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5. Phenological Characterization of Low Chill Peaches for Procreation of Desirable Inherent Stuff

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ABSTRACT : The present investigation was carried out to explore the possibility of peach genotypes grafted on peach seedling rootstocks for their phenological traits to elucidate the desirable genetic stuff. Twenty one genotypes including released varieties, land races and introductions were used in this study for assessment of the traits for yielding the better one through procreation. The study was conducted from 2011 to 2013 at orchard of Department of Fruit Science, PAU, Ludhiana, Punjab. A significant variation was recorded between the traits *viz.,* leaf length (LL), leaf breadth (LB) and leaf area (LA) among different peach genotypes. Leaf length was maximum (156.83 mm) in Tropicsweet and minimum in Redhaven (94.83 mm). The flower size (FS) was recorded maximum (44.00 mm) in genotype Shan-i-Punjab whereas the minimum was in genotype Punjab Nectarine (18.50 mm). Leaf length showed highest (r=0.71) correlation with leaf breadth, whereas, leaf breadth was positively and significantly correlated with leaf area , flower disc size, style number but negatively and significantly correlated with number of filaments, filament and style length. Hierarchical cluster analysis obtained by using DAR win 5.0 software allowed the assessment of dissimilarity relationship among the peach genotypes. The boots trap for each of the genotypes for different characters was run for 5000 times which

confirmed the authenticity of similarity and dissimilarity among them. UPGMA produced Dendrogram initially have three main clusters, cluster B being the largest having 9 genotypes.

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6. Improvement in Shelf-Life of Strawberry (*Fragaria* × *ananassa* Duch.) cv. Winter Dawn with Edible Coatings Enriched with Chitosan

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ABSTRACT: A lab experiment was conducted during February-March, 2015 on strawberry (*Fragaria* × *ananassa* Duch.) to study the effect of Calcium Chloride, Carboxymethyl cellulose and Chitosan on physical and chemical characters having 14 treatments treated with calcium chloride and CMC (1%, 2% and 3% each) without adding Chitosan and with Chitosan 1%. Application of Carboxymethyl cellulose 2% + Chitosan 1% to the strawberry fruits helped to maintain all the characters attributing to quality. These treatments reduced the weight loss and spoilage during storage. Under these treatments strawberry could be stored for over 12 days (fruit still reddish in colour) compared to the control which started turning turbid yellow soon after 9 days. These treatments can be used satisfactorily by the fruit growers and the fruit merchants in order to prolong the storage life of strawberry fruits up to 12 days. However, these results are only indicative and require further experimentation to arrive at more consistent and final conclusion.

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7. Response of Organic and Inorganic Source of Nutrients on Growth, Yield and Nutrients Uptake Status of Fenugreek (*Trigonella foenum-graecum*) cv. RMT–1

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ABSTRACT : A field experiment was conducted during 2012-13 at Department of Horticulture, JNKVV, Jabalpur (M.P.). The present study revealed that fenugreek cv. RMT–1 responded best in terms of yield and its attributing traits. Treatment T_6 (10 t FYM + 50% N + *Rhizobium*) was found significantly superior as compared to other treatments. Highest morphological characters *i.e.* plant height, number of branches per plant and dry weight plant^{-1}) and yield attributes *i.e.* number of pods plant^{-1}, pod length, number of seeds plant^{-1}, test weight, vegetative yield plant^{-1} and seed yield plant^{-1}, per plot and ha^{-1}) were recorded in T_6 (10 t FYM + 50% N+ *Rhizobium*) followed by T_5 (10 t FYM + 50% Nitrogen). The earliest first flowering, 50% flowering and maturity were recorded under treatment T_3 (20 t FYM). Nitrogen content and uptake was observed significantly higher with the application of T_{12} (5 t Poultry manure + *Rhizobium*) whereas, uptake of phosphorus was maximum with T_{12} (5 t Poultry manure + *Rhizobium*). Potassium content (seed and straw) and uptake increased with application of T_{14} (5 t PM + 50% N + *Rhizobium*). It is revealed from the data that a significantly maximum seed yield of 23.48 q/ha was recorded in variety RMT– 1 in treatment combination T_6 (10 t FYM + 50% N + *Rhizobium*) along with net return of ₹ 65,273/ha and cost benefit ratio of 1: 3.28.

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8. Variation in Flowering Characters of Bottle Gourd

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ABSTRACT : Selection for early maturing and high yielding genotypes is desirable which in monoecious crops depend on expression of flowering characters. A study was undertaken to understand flowering behaviour of

27 genotypes of bottle gourd that would help to assume the conversion of flowers into fruits. The field experiment was carried out late in rainy season of 2013 at Horticulture Farm of Visva-Bharati University and observations were recorded for various flowering characters. Analysis of variance revealed highly significant differences among genotypes for node number of first male and female flower, days to first male and female flower opening, number of male flowers per vine, number of female flowers per vine and sex ratio. The values of flowering characters ranged for node number of first male flower (5.67-13.20), node number of first female flower (7.80-14.87), first male flower opening (50.30-82.00 days), first female flower opening (53.33-87.50 days), sex ratio (4.73-14.87), number of male flowers (38.30-90.17) and number of female flowers (3.00-14.70) Out of 27 genotypes, APBG-3 was identified as an early bearer genotype which produced male and female flower at earlier nodes on about 50 and 53 days after sowing, respectively. Surabhi recorded the lowest sex ratio but maximum female flowers in number were recorded with Kundan that can be expected to produce higher yields than others.

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9. Study on The Growth and Yield Attributes of Marigold (*Tagetes spp.*) Hybrids under Dharwad Condition*

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ABSTRACT : The present investigation was conducted during kharif 2014-15 at Floriculture Unit of New Orchard, Department of Horticulture, UAS, Dharwad with the objective to find out the suitable marigold hybrids for cultivation under Dharwad condition. There were significant differences among the hybrids with respect to vegetative and floral characters. Among the hybrids, Double Orange, Garland Orange and Sarpan-11 were found to be superior with respect to vegetative growth, flower yield and quality of marigold.

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10. Effect of Planting Geometry and Nitrogen on Growth, Flowering and Yield of Chrysanthemum (*Chrysanthemum coronarium* L.)

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ABSTRACT : A field experiment was conducted during *Rabi* season of 2013-14 to study the effect of planting geometry and nitrogen on growth, flowering and yield of chrysanthemum (*Chrysanthemum coronarium* L.) at College of Horticulture & Forestry, Jhalawar (Raj.). The experiment consisted of 16 treatment combinations of four spacings (S_1- 30 cm $\times$ 30 cm, S_2- 30 cm $\times$ 45 cm, S_3- 45 cm $\times$ 45 cm, S_4- 45 cm $\times$ 60 cm) and four nitrogen levels (N_0- 0 kg, N_1 - 100 kg, N_2 - 150 kg, N_3 - 200 kg N/ha). The treatment S_4N_3 (45 cm $\times$ 60 cm spacing + N 200 kg/ha) recorded the maximum plant spread (2643.24 cm^2), number of primary branches per plant (41.90), number of leaves per plant (1013.20), leaf width (3.85 cm), leaf length (6.34 cm) and duration of flowering (64.33 days), while the treatment S_1N_3 (30 cm x 30 cm spacing + N 200 kg/ha) had the maximum plant height (92.58 cm), flower yield per plot (11.85 kg) and flower yield per ha (182.87 q). Application of nitrogen at different levels and planting geometries significantly influenced the number of days taken for first flower bud appearance and 50 per cent flowering with the earliest first flower bud appearance (47.33 days) and 50 per cent flowering (64.83 days) at S_1 (30 cm $\times$ 30 cm spacing). Similarly nitrogen at N_0 (N 0 kg/ha) had the earliest first flower bud appearance (46.75 days) and 50 per cent flowering (63.25 days), while nitrogen at N_3 (200 kg/ha) had the latest first flower bud appearance (55.33 days) and 50 per cent flowering (69.42 days).

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11. Influence of Different Drying Methods and Pre-treatments on Quality Parameters of Dehydrated Pole Type French Bean

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ABSTRACT : The experiment was conducted to study the effect of different drying methods and pre-treatments for maximum retention of quality parameters of pole type French bean (*Phaseolus vulgaris* L.). The results revealed that tray dryer was found superior for dehydration of pole type French bean samples pre-treated with 1 per cent KMS without blanching which recorded higher total soluble solids (TSS), low titrable acidity (TA) and marginally low crude protein content compared with other drying methods.

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12. Response of Hybrid Orchid (*Dendrobium spp.*) cv. Sonia to Application of Micronutrients

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ABSTRACT : An experiment on response of hybrid orchid, *Dendrobium spp.,* cv. 'Sonia' to selected micronutrients was conducted in the Experimental Farm, Department of Horticulture, Assam Agricultural University, Jorhat during 2012 to 2013. The experiment was conducted in shade net house with eight treatments each replicated thrice. Micronutrient treatments viz.,T_1- Zinc 500 ppm, T_2-Zinc 750 ppm, T_3-Zinc 1000 ppm, T_4-Manganese 200 ppm, T_5-Manganese 400 ppm, T_6-Boron 100 ppm and T_7-Boron 200 ppm were applied as foliar spray at an interval of 15 days along with fertilizer mixture 19 All @ 2 g per liter (control) sprayed twice a week. Among the micronutrient treatments, Zinc 1000 ppm (T_3) was found superior in respect of the parameters *viz.,* pseudo bulb height (29.85), number of leaves/plant (7.08), leaf area (68.66 cm^2), inter nodal length (5.26 cm), cane girth (2.43 cm), spike length (28.91 cm), number of florets/spike (4.03), flower spike yield /coco block/year (5.53), number of flowering canes / clump (2.00), duration of flowering (149.20 days), self life (52.22 days), vase life (37.00 days), total soluble sugar (107.24 mg/g DW), soluble protein (436.39 mg/g FW), net assimilation rate (0.35 mg/cm2/day) and total chlorophyll content (0.83 mg/g FW) while treatment T_2(RDF + Zn 750 ppm) recorded best for days to flower bud appearance (133.37 days) and days to harvest of spike (3.47 days).

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13. Effect of Foliar Application of Zinc and Boron on Yield and Quality of Pomegranate (*Punica granatum* L.) cv. Ganesh under Subtropical Conditions of Garhwal Hills

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ABSTRACT : An experiment was conducted on ten year old pomegranate trees cv. Ganesh at Horticultural Research Centre, Chauras, HNB Garhwal University, Srinagar Garhwal, Uttarakhand during summer season 2012 to find out the effect of foliar application of zinc and boron on yield and quality of pomegranate (*Punica granatum* L.) cv. Ganesh. The experiment was laid out in randomized block design with three replications. The treatment consisted of two foliar applications of Zinc sulphate and Boric acid with their combinations *viz.,* T_1 (Zn @ 0.4%), T_2 (Zn @ 0.5%), T_3 (Zn @ 0.6%), T_4 (B @ 0.4%), T_5 (B @ 0.5%), T_6 (B@ 0.6%), T_7 (Zn+B @ 0.4% each), T_8 (Zn+B @ 0.5% each), T_9 (Zn+B @ 0.6 % each) , and T_{10} (control). The findings revealed that the average values for fruiting percentage (67.83 %), weight of fruits (202.88 g), length of fruits (7.00 cm), volume of fruits (213.33 ml), fruit yield (35.16 kg/tree), acidity of fruits (0.34 %) and vitamin C content of fruits (48.00 mg/100g) were found to be the highest under the treatment T_7 (Zn+B @ 0.4 % each). The maximum fruit diameter (6.63 cm), specific gravity (0.98 g/cm^3) and vitamin A content (14.87 ìg/100g) were observed under the treatment T_5 (B @ 0.5%). The highest value for TSS content (13.33 °Brix) of fruits was recorded under treatment T_4 (B @ 0.4%). The treatment combination of boric acid and zinc sulphate @ 0.4 % each gave superior fruit yield and quality of pomegranate.

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14. Intensity of Anthracnose Disease (*Colletotrichum capsici* Sydow.) on Chilli Crop in Jaunpur District Region of Eastern U.P.

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ABSTRACT: Anthracnose, caused by *Colletotrichum capsici,* is one of the most destructive diseases of chilli which causes a chief hindrances in chilli production. Typical anthracnose symptoms on chilli fruit appear as sunken necrotic tissues with concentric rings of acervulii. To assess the incidence and severity of anthracnose disease on chilli crop, a survey was conducted in 5 chilli growing areas of Jaunpur district of Eastern Uttar Pradesh. During the survey it was observed that percentage of incidence was more in green fruit and leaves than older parts.

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15. Estimates of Genetic Components and Related Statistics of Diallel Cross in Vegetable Pea (*Pisum sativum* L.)

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ABSTRACT : The experiment was carried out at Farm of Krishi Vigyan Kendra, Pampoli, East Kameng, Arunachal Pradesh during 2012-13.Generation means analysis was carried out to estimate the nature and magnitude of gene action in order to formulate breeding strategy for identifying the segregates with desirable horticultural traits and resistant to powdery mildew disease. The testing of validity of the assumptions is based on estimated values of t^2 and regression coefficient (b) based on F_1s. It is clear from the table that t^2 was significant for pod length, pod width and 100 grain weight which reflect the failure of one or few assumptions.

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16. Field Efficacy of Some Insecticides and Biopesticides for the Management of Shoot Gall Psylla, *Apsylla cistellata* Buck.

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ABSTRACT: Studies were conducted to study the field efficacy of insectides, botanicals and entomopathogenic fungi for the control of shoot gall psylla, *Apsylla cistellata* Buck and subsequently their effect on fruit set and fruit yield of mango. Maximum per cent embryo mortality and minimum number of galls/twig and nymphs/gall were recorded in monocrotophos followed by quinalphos whereas minimum per cent embryo mortality and maximum number of galls/twig and nymphs/gall were observed in nimbicidine, neem seed kernel extract, *Baeauveria bassiana* and control. Maximum fruited shoot, fruits harvested and fruit yield were recorded in monocrotophos and quinalphos whereas about zero fruit yield was recorded in nimbicidine, neem seed kernel extract, *B. bassiana* and control.

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17. Effect of Biofertilizer on Growth and Yield of Banana cv. Grand Naine (Ratoon Crop) in West Central Zone of Odisha

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ABSTRACT : A field experiment was conducted to access the effect of different biofertilizers on growth and yield of ratoon crop of tissue cultured banana cv. Grand Naine. The experiment was laid out in RBD with 5 treatments, each replicated four times. The experiment consisted the application of recommended dose of fertilizers (RDF) and RDF was combined with organic manure and biofertilizers (*Azospirillum, Azoctobactor,* Phosphorus solubilising bacteria) at different combinations to know their effect on growth and yield of ratoon

banana *viz :* T_1 (control), T_2 (100% RDF, 300:100:300 g NPK/plant), T_3 (100% RDF +75g biofertilizers: *Azotobacter, Azospirillum* & PSB 1kg each in 25 kg of vermicompost in the ratio of 1:1:1), T_4 (100% RDF +100 g biofertilizer: *Azotobacter, Azospirillum* & PSB 1kg each in 25 kg of vermicompost in the ratio of 1:1:1) and T_5 (100% RDF +125 g biofertilizer : *Azotobacter*, *Azospirillum* & PSB 1kg each in 25 kg of vermicompost in the ratio of 1:1:1). There was a positive response in plant growth in term of height and girth. Application of 100% RDF +125 g of biofertilizers in 3 split doses (T_5) recorded better growth in tissue culture banana follow by T_4 and T_3 and the treatment recorded better physiological activity in term of ascorbic acid content and pulp: peel ratio. Yield attributing characters like bunch weight, number of hands per bunch and number of finger per bunch also maximum in T_5.

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18. Loss assessment by Releasing Hoppers on Young Shoots and Flowering and Fruited Panicles of Mango

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ABSTRACT : Loss assessment study by hopper on shoots showed that per cent leaf infestation per shoot increased significantly with the increase in hopper population. Maximum infestation (91.47%) occurred on shoots having 20 hoppers per shoot, whereas those with 10 and 15 hoppers per shoot suffered more or less 50 per cent infestation. Number of hopper eggs per leaf also varied significantly with the increase in hopper population. Maximum eggs (15.40 per leaf) were recorded on leaves where 20 hoppers per shoot were released. Per cent increase in shoot length was also affected significantly with the increase in hopper population. It was minimum (4.88) where 20 hoppers per shoot were released. However, the shoots with 0 and 5 as well as 10 and 15 hoppers per panicle were also at par. Per cent reduction in fruit set was maximum (95) on panicles where 20 hoppers per panicle were released. However no significant differences were observed on panicles where hoper populations were 10, 15 and 20. Per cent fruit drop was maximum (81.25) where, 30, 35 and 40 hoppers per panicle were released and minimum (8.81) where no hopper was released. Percent reduction in fruits weight per panicle was maximum (84.58) where 40 hoppers per panicle were released and minimum (14.60%) with 5 hoppers per panicle.

Published in : HortFlora Research Spectrum, 5 (1) : 78-80 (March 2016)

19. Effect of Nitrogen, Phosphorus and Potassium on Growth, Yield and Quality of Tomato Grown in Open Condition

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ABSTRACT : The experiment on effect of NPK on growth, yield and quality of tomato (*Solanum lycopersicum* L.) grown under open condition was conducted at Department of Horticulture, SHIATS, Allahabad, (U.P.) during *Rabi* season 2014-15. The seedling of cultivar undertaken for research was Hybrid GS-600 and fertilizers applied in the experiment were Urea, SSP and MOP. The experiment was laid out in RBD with 3 replications and 9 treatments. The results revealed that significantly maximum plant height (165.70 cm), number of leaves/plant (114.52) and number of fruit clusters (7.31) were produced in T_7 (140:80:60 kg/ha NPK). Number of fruits/ cluster (7.30), number of fruits/plant (52.85), fruit weight (76.41g) and fruit yield/ plant (4.03 kg) and per hectare (0.952 t/ha) were recorded maximum in T_5 (120:80:75 kg/ha NPK). Maximum TSS (4.29 °Brix) and shelf life (18.70 days) were recorded in T_6 (120:80:90 kg/ha NPK) under Allahabad agro climatic conditions.

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20. Pre-harvest Fruit Bagging Improves Fruit Quality of Mango in Doon Valley

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ABSTRACT : Bagging in different fruit crops is beneficial because it improves appearance of fruit along with quality. A trial was conducted on 15 year young mango (cv. Mallika) orchard grown on degraded lands during 2014-015. The three different types of paper bags (Plastic bag, Blue paper, News paper) with control (Without bagging) were used for bagging of fruits after fruit formation (pre-harvest bagging) each with 100 no. of fruits for assessing incidence of insect, disease, fruit cracking and fruit blackening. Blue paper bagged fruits were recorded maximum improvement in fruit appearance like least insect-pest and disease attack in the fruit over un bagged fruits in Malika mango. Similarly, minimum fruit cracking and blackening was recorded in bagged treatment over unbagged treatment. Hence, fruit bagging in mango with blue paper bag is recommended for commercial use to the growers to escape attack of insect- pests and diseases, fruit cracking, and blackening.

Published in : HortFlora Research Spectrum, 5 (1) : 84-85 (March 2016)

21. Effect of Type of Cuttings and Concentration of NAA on the Rooting Performance of Jasmine (*Jasminum humile*)

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Department of Horticulture, C. C. R. (P. G.) College Muzaffarnagar (U.P.)
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ABSTRACT : The experiment was carried out during year 2014 at the field Horticulture Garden of C. C. R. (P. G.) College, Muzaffarnagar (U.P.).The experiment comprised of the types of cuttings and NAA concentration. The type of cuttings (hard wood, semi hard wood and soft wood) were treated at 0 ppm, 1500 ppm, 3000 ppm and 4500 ppm of NAA Treated cuttings were planted in factorial R.B.D. with 12 treatments. NAA at 4500 ppm caused earlier sprouting over control. NAA at 1500 ppm improved the length of the shoot and number of leaves. Number of roots, length of the roots, rooting percentage and survival percentage were improved at 4500 ppm in case of *Jasminum humile*. While mortality percentage increased under hard wood cutting at 1500 and 3000 ppm concentration of NAA. Moreover, mortality percentage was highest in control. Semi hard wood cuttings treated with 4500 ppm NAA proved better than all other treatments.

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2. Johnson, D.A. (1940). *Plant Microtechnique.* McGraw- Hill Publishing Co. Ltd., New York. PP-29

3. Kapil, R.N. and Arora, S. (1990). Some fascinating features of orchid pollen. *J. Orchid Soc.*, **4** (1): 9-28.

4. Rashid, S., Ashraf, M., Bibi, S. and Anjum, R. (2000). Antibacterial and antifungal activities of *Launaea nudicaulis* Roxb. and *Launaea resedifolia* L. *Pakistan J. Biol. Sci.*, **3** (4) :630-632.

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ABSTRACTS

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1. Growth and Physiological Correlations in Custard Apple cv. Raidurg under Consortium of Vermicompost and PSB

Asha Sharma[1], *P. Bhatnagar**, *J. Singh*[1], *M. K. Sharma*[2] *and M.C. Jain*[2]
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ABSTRACT : The field experiment on Influence of Vermicompost and PSB on growth and carboxylation efficiency of custard apple (*Annona squamosa* L.) cv. Raidurg was carried out at Fruit Research Farm, Department of Fruit Science at College of Horticulture and Forestry, Jhalawar (Rajasthan) during study period from October 2014 to April 2015. The experiment consisted of different doses of Vermicompost (2kg/plant, 4kg/plant and 6kg/plant) along with PSB (25g/plant, 50g/plant and 75g/plant) and its combination. The results revealed positive correlation of photosynthesis with increase in no. of shoots/branch; increase in canopy volume and percentage increase of scion girth under interactive effect of Vermicompost @ 6kg + PSB 75g/plant .The result showed that maximum per cent increase in East-West (18.22%), North-South spread (17.83%), plant height (18.34%), canopy volume (34.50%), leaf length (29.36%) as well as leaf width (25.77%), increased number of shoots (15.78), scion girth (8.28%), rootstock girth (8.51%) and relative water content (73.71%) were recorded under T_{15} treatment *i.e.* Vermicompost@ 6kg + PSB 75g/plant. The carboxylation efficiency parameters were also observed maximum in respect of photosynthetic rate(5.60µmol $CO_2m^{-2}s^{-1}$), photosynthetic active radiation (1608.33mmol $m^{-2}s^{-1}$), stomatal conductance (14.67 m mol $m^{-2}s^{-1}$), leaf temperature (38.13°C), relative humidity (5.84%), internal CO_2 concentration (284.67ppm), transpiration rate (1.33 mmol $m^{-2}s^{-1}$), and minimum vapour pressure deficit (47.80 mb) were noted under T_{15} treatment (Vermicompost 6kg + PSB 75g/plant).

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2. Survey, Collection and Characterization of Elite (Heavy Bunch) Somaclonal Variants from Tissue Cultured 'Grand Naine' Banana (*Musa spp.* AAA) in Farmers' Fields around Bangalore

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ABSTRACT : The present study was carried out during the period 2006-07 to characterize the elite (heavy bunch) somaclonal variants of tissue cultured 'Grand Naine' banana from the farmers' fields around Bangalore by visual screening. A total of eleven elite variants were collected and compared with original 'Grand Naine' (control) plants. Of all the elite somaclonal variants collected and evaluated, the variant GNV-04 was found very promising. It had significantly showed higher bunch weight (59.75 kg), bunch length (2.00m), number of hands per bunch (21.01) and number of fingers per hand (20.01). The quality parameters such as TSS, reducing and total sugars were significantly higher, with moderate titratable acidity. The organoleptic evaluation tests significantly favoured the control to a certain extent, but taste and texture were better with the variant GNV-04 compared to control. To confirm the variants at DNA level, RAPD analysis was conducted to identify the difference in the banding patterns. Forty three primers were used for the analysis of which OPF-09 differentiated the variants and the normal Grand Naine bananas. A band size of 320 bp was produced in all the normal samples but was absent in the variants tested. In the present study RAPD markers were proved to be effective and precise to confirm the variants identified using molecular characters. Of the eleven superior

variants analysed, variants GNV-04, GNV-08 and GNV-10 showed positive phenotypic characters which could be used in developmental programmes of Grand Naine banana.

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3. Variability in Eggplant (*Solanum melongena* L.) Cultivars as Revealed by SDS-Page of Seed Protein

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ABSTRACT : Fourteen genotypes were distinguished into nine groups on different banding patterns in three zones (A, B and C). PB 64 and PB 66; BARI and Pant Rituraj; KS 331, PB 69 and Punjab Sadabahar; PB 70, SMB 115 and PB 67 fell in four different groups and showed similar banding pattern within the group. PB 64 and Pant Rituraj exhibited similar banding pattern (100%). Similarly, PB 66 and BARI, KS 331 and Punjab Sadabahar, KS 331 and PB 70, Punjab Sadabahar and Pant Samrat, PB 70 and SMB 115 showed 100 percent similarity in seed protein profiles. There were sufficient variability among the PB 69 and PB 67, PB 67 and Pusa Upkar, PB 67 and Pant Samrat. The minimum genetic similarity was observed between PB 69 and PB 67 (44%) followed by Punjab Sadabahar and PB 67 (47%) by PB 67 and Pusa Upkar (47%) and PB 67 and Pant Samrat (47%). The UPGMA analysis showed that PB 60, PB 68 PB 64, Pant Rituraj, PB 66, BARI and PB 69, KS 331, PB 70, SMB 115, Punjab Sadabahar, Pant Samrat, Pusa Upkar formed two different clusters. However, PB 60; PB 68; PB 64 and PB 66; BARI and Pant Rituraj; KS 331, PB 69 and Punjab Sadabahar; PB 70, SMB 115 and PB 70; Pusa Upkar; and Pant Samrat were three different neighbouring groups.

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4. Effect of Pre-Harvest Spray of Calcium Nitrate, Boric acid and Zinc Sulphate on Yield and Quality of Nagpur Mandarin (*Citrus reticulata* Blanco)

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ABSTRACT : Genetic variability and correlation coefficient were studied in fifty genotypes of bael fruit at Horticulture Reasearch Centre and laboratory of the Department of Horticulture, SVPUA&T, Meerut in two consecutive years *i.e.,* 2013-14 and 2014-15. Data were recorded on 16 morphological and qualitative traits. Invariably commercially released cultivars *viz.,* Pant Shivani, Pant Aparna, Pant Sujata along with genotypes VB-28 and VB-23 exhibited higher yield and yield contributing traits. High values of GCV and PCV were observed for yield per tree, fruit pulp weight, fruit weight, seed weight, number of fruits per tree, ascorbic acid, skull weight, and reducing sugar. High heritability (in broad sense) along with high estimates of genetic advance (% of mean) was observed for almost all the characters viz. yield per tree, fruit weight, fruit pulp weight, skull weight, seed weight per fruit, T.S.S., ascorbic acid and total sugar. The present study also revealed the presence of great amount of genetic variability which offers bright prospects for its improvement in near future.

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5. Response of China Aster (*Callistephus chinensis* L. Nees) cv. Poornima to Different Levels of Nitrogen and Phosphorus in Medium Black Soil

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ABSTRACT : The present investigation was carried out to explore the possibility of peach genotypes grafted on peach seedling rootstocks for their phenological traits to elucidate the desirable genetic stuff. Twenty one genotypes including released varieties, land races and introductions were used in this study for assessment of the traits for yielding the better one through procreation. The study was conducted from 2011 to 2013 at orchard of Department of Fruit Science, PAU, Ludhiana, Punjab. A significant variation was recorded between the traits *viz.,* leaf length (LL), leaf breadth (LB) and leaf area (LA) among different peach genotypes. Leaf length was maximum (156.83 mm) in Tropicsweet and minimum in Redhaven (94.83 mm). The flower size (FS) was recorded maximum (44.00 mm) in genotype Shan-i-Punjab whereas the minimum was in genotype Punjab Nectarine (18.50 mm). Leaf length showed highest (r=0.71) correlation with leaf breadth, whereas, leaf breadth was positively and significantly correlated with leaf area , flower disc size, style number but negatively and significantly correlated with number of filaments, filament and style length. Hierarchical cluster analysis obtained by using DAR win 5.0 software allowed the assessment of dissimilarity relationship among the peach genotypes. The boots trap for each of the genotypes for different characters was run for 5000 times which confirmed the authenticity of similarity and dissimilarity among them. UPGMA produced Dendrogram initially have three main clusters, cluster B being the largest having 9 genotypes.

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6. Influence of Pre-Harvest Foliar Application of Nutrients and Growth Regulators on Fruit Quality of Litchi (*Litchi chinensis* Sonn.) cv. Rose Scented

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ABSTRACT : In order to maintain and enhance fruit quality and storability of litchi the present study was conducted at Horticultural Research Centre, GBPUA&T, Pantnagar, Uttarakhand during 2013-14 and 2014-15. Different pre-harvest sprays of nutrients and growth regulators were sprayed individually or in combination with each other, viz., calcium chloride @ 0.5%, potassium sulphate @ 0.5%, borax @ 1%, putrescine @ 40ppm, salicylic acid @ 100ppm and ascorbic acid @ 0.2% on litchi to ascertain their effect on fruit chemical characters. The analytical study of the data revealed that treatment with a combination of $CaCl_2$+ K_2SO_4 + Borax @ 0.5 % + 0.5 % + 1.0 % had best effect on TSS (21.05 °B), titratable acidity (0.44 %), ascorbic acid (28.16 %), total sugars (15.39 %), reducing sugars (11.48 %), non-reducing sugars (3.90 %) and TSS: acid ratio (31.62).

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7. Effect of Organic Manures on Growth, Yield and Quality of Radish (*Raphanus sativus* L.) cv. Pusa Desi

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ABSTRACT : A field trial was conducted during 2014-15 in winter season at Horticultural Research Centre, Chauras Campus, H.N.B Garhwal University, Srinagar (Garhwal), Uttarakhand to study the effect of organic manures on growth, yield and quality of radish cv. Pusa Desi. The experiment consisted of 19 treatments with control, laid out in Randomized Block Design with three replications. The quantitative parameters were recorded at 15 days interval.The maximum plant height (36.13 cm) number of leaves (16.88) at 60 days, leaf length (17.17 cm), total plant height (58.68 cm) and root length (20.04 cm) were recorded with the combined application of organic manures (Vermicompost 50% + Poultry manure 50%). Whereas, the total plant weight (305.04 g), fresh weight of leaves (134.77 g), root weight (197.07 g), root diameter (5.74 cm) and yield/ha (36.42 t/ha) were significantly maximum with with the combined use of (FYM 100% + Vermicompost 100% + Poultry manure 100%). The quality parameters like T.S.S (6.15 °B) and Vit.C (18.13 mg/ 100g) were recorded maximum in combined application of FYM 50% + Poultry manure 50% and acidity (0.64) was maximum due to the FYM 100%. The study suggested that the combined application of Vermicompost 50% + Poultry manure 50% or (F.Y.M + Vermicompost + Poultry manure) were highly beneficial for all of the growth, yield and quality parameters.

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8. Expression of Heterosis and Combining Ability Analysis in Intervarietal Crosses of Eggplant (*Solanum melongena* L.)

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ABSTRACT : Thirty six genotypes (twelve lines, two testers and twenty-four F_1s) of eggplant were studied for heterosis and combining ability. The crosses PR × PS and BARI × PS revealed highest economic heterosis for most of the traits investigated including the yield and yield attributing characters. The crosses PR × PS, BARI × PS, PB 69 × PS and Punjab Sadabahar × PU demonstrated highly significant heterosis, over the standard cultivar, Pant Samrat. The parent PB 69 exhibited highest positive significant gca followed by PB 66 and PB 67, whereas crosses PB 69 × PU, PB 60 × PS, PB 68 × PU, PR × PS and KS 331 × PS showed significant sca effects for total yield.

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9. Study on the Effect of Nutrient Management on Seed Crop of Okra var. Parbhani Kranti

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ABSTRACT : The sixteen treatments were compared in randomized block design (RBD) with three replications. The seed was sown at spacing of 45 cm x 15 cm on ridges. The seed-pods were picked before shattering through successive pickings as and when required. The studies were concentrated on crop-stand, plant-growth and development traits, crop productivity, seed quality and net profit (₹) per hectare. It is inferred from the findings that the seed crop of okra cv. Parbhani Kranti during the spring-summer (Zaid) season should be cultivated in western Uttar Pradesh by applying nitrogen @ 100 kg ha^{-1}, phosphorus @ 40 kg ha^{-1} and *Azotobacter* @ 2 kg ha^{-1}.

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10. A Technology for Management of Litchi Mite using IPM Modules under Subtropics of Bihar

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ABSTRACT : Litchi mite is the threat to litchi growers as both nymphs and adults damage the leaves, inflorescence and young developing fruits. Therefore, keeping in view the importance of litchi mite, Aceria litchii field trial was conducted at ICAR-NRCL, Muzaffarpur to manage the pest. Experiment was laid out in RBD design with seven treatments comprised of pruning of affected twigs (July & October) and miticides (chlorfenapyr & propargite) sprayed twice in July and once in October months to evaluate the efficacy of various integrated approaches. Results revealed that initial mite infestation ranged from 97.33 to 98.80%. No mite infestation was recorded at flowering stage in pruning and removal of affected twigs followed by two spraying of chlorfenapyr 10 EC (0.03%) at 15 days interval during July and again pruning in October with one spraying of Chlorfenapyr followed by spraying of propargite 57 EC (0.17%) with 1.33% mite infestation. The higher mite infestation was noticed during August (50.00) to November (80.00) and again the population start increasing from February onwards on new shoots.

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11. Evaluation of Fertilizers and Micronutrients for the Control of Mango Hopper

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ABSTRACT : Effect of fertilizers and micronutrients on hoppers showed that the treatment 1.5 kg N + 1 kg P_2O_5 and 1 kg K_2O along with Cu, Zn, B and S applied was most effective in checking multiplication of hopper population, whereas the treatment with 2 kg N only was least effective as maximum hopper population (20.06 hopper per panicle in 3rd observation) was recorded here. However, in rest of the treatments, hopper population was more or less equal to control. Maximum fruit set (189.75 and 139.25 fruits per 100 panicles) was observed in the treatment where 1.5 kg N, 1.0 kg P_2O_5 and 1 K_2O were used along with Cu, Zn, B and S that was significantly different from control followed by the fruit set in recommended dosage. Minimum fruit set (116.00 and 105.25 per 100 panicles) was recorded in control. Fruit harvested and fruit weight were again highest (110.25 and 21 kg per 100 panicles) where 1.5 kg N, 1.0 kg P_2O_5 and 1 kg K_2O were used along with Cu, Zn, B and S followed by fruit yield in recommended dosage. Lowest fruit number and fruit weight (100.25 and 16.30 kg per 100 panicles) were observed in treatment where only 2.0 kg N was used.

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12. Genetic Variability, Heritability and Genetic Advance in Chilli (*Capsicum annuum* L.)

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ABSTRACT : The present investigation was carried out to find out the genetic variability, heritability and genetic advance in chilli (*Capsicum annuum* L.) in Central Uttar Pradesh during Rabi season. The experiment was laid out in randomized block design with three replications. Transplanting of seedlings was done at spacing of 45x60 cm. The observations were recorded on five plants per plot for days to flowering, plant height, number of branches/plant, number of fruits/plant, leaf area, pedicle length, fruit length, fruit width, days to first harvest and fruit yield per plant. The genotypes Azad Mirch-1, Sel-16 and 7919 performed better in terms of leaf area with maximum values (116.38) which succeeded by fruit yield per plant red ripe (85.40), fruit width (38.23), number of branches per plant (34.43), days to 50% flowering (32.46), days to first harvest (27.83), pedicel length (27.78), fruit yield/plant (17.73), fruit length (16.64) and plant height (12.76) for genetic advance as % of mean.

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13. Evaluation of number of irrigations on Hopper Management

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ABSTRACT : Effect of different number of irrigations on hoppers showed that maximum hopper populations were recorded in nine irrigations where one irrigation each in October, December and February and two irrigations each from April to June were given, whereas hopper population were at par in five irrigations where two irrigations each in April and May and one irrigation in June were given, in two irrigations where one irrigation each in April and May were given and in control where no irrigation was done. The fruit set was significantly different in all treatments as compared to control whereas maximum fruit set (190.42 and 126.42 fruits/panicles) was recorded in five irrigations. Fruits harvested were maximum (108.57 fruits/100 panicles) in five irrigations that were significantly different from control. Weight of fruits per 100 panicles was maximum (18.80 kg) in five irrigations, which were at par with the two irrigations, and nine irrigations, however all these were significantly different from the control where minimum (16.38 kg/100 panicles) fruit weight was recorded.

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14. Effect of Different Nitrogen Doses, *Azotobactor*, PSB and PMB on Plant Vigour, Flowering and Yield of Petunia (*Petunia hybrida*) var. Picotee

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ABSTRACT : The present experiment was conducted to study the effect of bio and chemical fertilizers on plant vigour, flowering and yield of petunia (*Petunia hybrida*) var. Picotee in the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, (U.P.) during the winter season 2014-2015. The results revealed that treatments T_{13} (*Azotobactor* + PSB +PMB + 100% doses of NPK) had significant response most of the traits studied. The maximum plant height (29.80 cm), number of leaves/plant (600.60) number of branches/plant (20.00), plant spread (54.30 cm), first flower bud emergence (53.06), diameter of flower/(8.26 cm), number of flowers/plant (76.93), weight of fresh flower (1.05g) and weight of dry flower (0.81g) were produced by the treatment T_{13} (*Azotobactor* + PSB +PMB + 100% doses of NPK).

Published in : HortFlora Research Spectrum, 5 (2) : 161-164 (March 2016)

15. *Picrorhiza kurroa* Royle ex Benth: A Plant with Pharmacological Value

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ABSTRACT: Western Himalaya is a reservoir of plants that constitutes a large number of economically important species of both pharmaceutical and medicinal importance. Many of these plant species have become rare and endangered and are in the verge of extinction due to over exploitation. One of such plant is Picrorhiza kurroa which is high altitude plant with a large number of therapeutic properties. Therefore, it is extremely important to explore the different methods of propagation and conservation of *P. kurroa* under in vitro conditions and also in its natural habitat.

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16. Use of pheromone traps for eco friendly management of fruit fly in Parwal–A Success Story

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ABSTRACT : Proper and prolonged humid conditions and sandy soil due to nearby land of river Ganga in Hastinapur block of Meerut district favours the cultivation of cucurbits. Thus, growing of Parwal has been proved as a best alternate to replace mono culture of sugarcane crop in the area where majority of farmers having small land holdings. Fruit fly is a serious pest not only of cucurbits but other vegetable and fruit crops also causing huge losses to farmers in Meerut district. In spite of using hazardous pesticides, farmers are bound to bear about 25 – 30 % yield loss every year due to the attack of fruit fly. Various front line demonstrations of cue lure containing pheromone traps were laid out by KVK Hastinapur, Meerut at the fields of parwal growers of the area during three consecutive years (2012 – 2014) to introduce and promote the eco friendly management technology of fruit flies by installation of 5 traps/ acre covering 30 acre area. The technology was found feasible, cheaper as well as easy to adopt at farmer's field. An average of 23.35 per cent increased yield was observed resulting ₹ 27182.5 average increased income per hectare comparing with plots under farmer's practice where traps were not installed.

Published in : HortFlora Research Spectrum, 5 (2) : 170-172 (June 2016)

17. Effect of Organic Manure and Inorganic Fertilizer on Growth and Yield of Onion (*Allium cepa* L.) cv. Pusa Red

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ABSTRACT : The experiment was laid out with nine treatments and three replications in Randomized Block Design. Maximum plant height, bulb size and weight was observed with the application of Urea 50% +

Vermicompost 50% per plot. Whereas, the maximum bulb weight was recorded with application of Urea 50% + Vermicompost poultry manure 25% each per plot. Application of different organic manures on onion bulbs is useful for improving the growth and yield characteristics.

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18. *Lasoda* that Blooms on Tree Trunk-A Report

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ABSTRACT : Lasoda (*Cordia myxa*) grows very common in tropical regions. Its tree flowers in March-April. Its inripe fruits are very much used for pickling. Ripe fruits of *lasoda* are rich source of minerals. Its leaves are used as for fodder. Usually Lasoda bears terminally, but some times bearing is noticed directly on the tree trunk, the bearing of flowers and fruits on trunk is termed as cauliflory.

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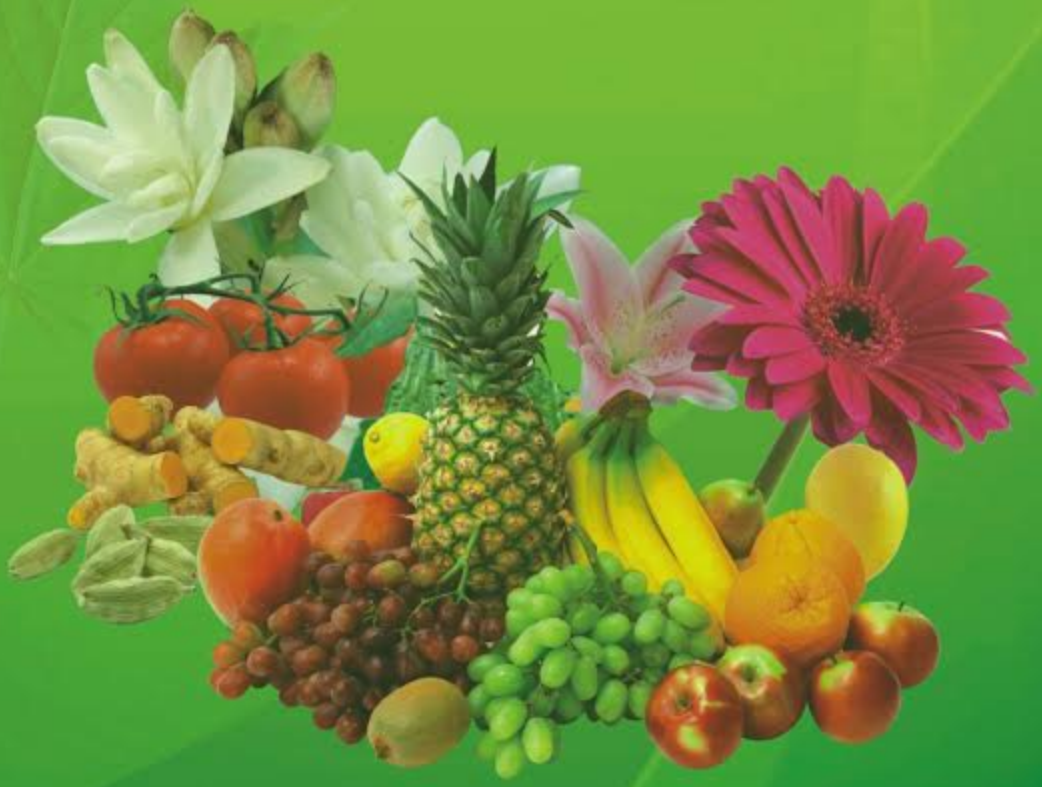

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ABSTRACT : Episodic in leaf, flower and fruit patterns of *Sterculia setigera* were examined in Metema woreda of north Gondar zone of the Amhara region, Northwest Ethiopia. Monitoring was conducted for the period of 24 months starting from September, 2011 to September, 2013. For the purpose, we selected 16 individual trees (Dbh ≥ 10 cm) of *S.setigera* trees at 100 m apart. The trees were measured for dbh, marked and mapped using a GPS and monitoring was conducted in every week. The results of monitoring revealed that pattern of leafing and leaf loss, flowering and fruiting are unimodal in lined with the nature of the rainfall pattern of the study area. Leafing was started at the end of dry season when the rain season begins (Mid May) and the trees were in full leaf (Peak leaf flushing) in June and continued peak in leafing during July. Shedding of leaves starts on October but was higher (peak) in December coinciding with the beginning of dry season. Uniformity was observed in blooming among trees and flowering was concentrated in April and ends at the beginning of mid-May. Early fruiting was observed during October. However, mass fruiting was observed during November and ends in in late December up to early January. Therefore, we concluded that seed harvesting of *S.setigera* is better to conduct in mid-November to beginning of December in the study area.

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2. Character Association and Path Co-efficient Analysis in Garlic (*Allium sativum* L.)

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ABSTRACT : Correlation co-efficient analysis in garlic (*Allium sativum* L.) revealed that total yield (rp=0.824), leaf length (rp=0.634), equatorial diameter of bulb (rp=0.559), leaf width (rp=0.544), plant height (rp=0.498) pseudostem diameter (rp=0.476), polar diameter of bulb (rp=0.460), average weight of bulb (rp=0.459) and days to maturity (rp=0.435) were positively and significantly associated with bulb yield plant^{-1}. Path analysis revealed that number of cloves bulb^{-1} (0.820) fallowed by pseudostem diameter (0.315), number of leaves plant^{-1} (0.163), leaf width (0.132), pseudostem length (0.091), equatorial diameter (0.050) and days to maturity (0.034) had the high positive direct effect on bulb yield per plant. It was also observed that the high negative direct effect was exerted by leaf length (–0.124) fallowed by plant height (–0.118), average weight of 10 cloves (–0.049) and polar diameter (–0.033). Hence, these characters should be given more weight age in selection programme of high yielding variety in garlic.

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3. Evaluation of Chrysanthemum (*Chrysanthemum morifolium* Ramat) Genotypes under West Garo Hills District, Meghalaya

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ABSTRACT : Evaluation of Chrysanthemum genotypes under West Garo Hills District, Meghalaya was carried out at the experimental farm, Department of Horticulture, North Eastern Hill University, Tura, Meghalaya 2015-2016 to identify the suitable variety for successful cultivation and flower production. Fifteen varieties namely, Korean Red, Korean Yellow, Solan Shringar, Ramblored, Yellow Star, Calabria, Ajay, AAU Yellow, White Star, Korean Bicolour, Charming, Lysid, Safin, Shayana and Gambit were selected for their evaluation. The experiment was laid out in randomized block design with three replications. Uniform package of practices were followed throughout the experiment to grow a healthy crop. Significant response in vegetative and flowering characters was observed in cultivar Calabria, Yellow Star, AAU Yellow, Gambit and Solan Shringar. Highest plant height (49.65 cm) in cultivar Yellow Star followed by cultivar Gambit (45.46 cm) was noticed. However, cultivar Solan Shringar showed maximum number of branches (12.51) and number of leaves per plant (125.11). Earliness in full bloom was associated with cultivar Shayana (72.29 days) followed by cultivar Calabria (82.44 days), while, maximum flower longevity after full bloom was observed in cultivar Gambit (24.72 days). Extended flowering duration was recorded with cultivar Calabria (140.84 days).Whereas, maximum vase life under tap water was observed in cultivar Ramblored (9.44 days) followed by cultivar Gambit (8.37 days). Cultivar Gambit showed maximum flower diameter (8.46 cm), flower head height (3.14 cm), number of ray florets per head (186.30), flower fresh weight (1.36 g) and dry weight (0.43 g), while, maximum number of flower head per plant (42.34), number of flowers per spray per plant (21.84) and number of sprays per plant (20.50) was observed in cultivar Calabria.

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4. Effect of Silicon Bunch Spraying and Bunch Bagging on Yield, Quality and Shelf Life of Banana var. Grand Naine

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ABSTRACT : An experiment was conducted to know the effect of bunch spraying of silicon and bunch bagging on fruit yield, quality and shelf life of banana var. Grand Naine. Potassium silicate was applied as three sprays at 30 days interval after emergence of inflorescence followed of bagging of bunches. Sprays were given at concentration of 2.0, 4.0 and 6.0 ml/lit per bunch 30 days interval then followed by bagging of bunches with polyethylene sleeves after spraying till harvest of fruits. Fruit characters like fruit weight, fruit length, fruit diameter, bunch weight and maximum shelf life (12.33 days) was recorded in treatment applied with bunch spraying of potassium silicate 6 ml/l per bunch bagging. The quality parameters *viz.,* total sugars, acidity, total soluble solids, starch content of the fruit were also significantly influenced by same treatment.

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5. Nutritional Status of Malta orchards in Bikaner district

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ABSTRACT : The nutritional survey studies conducted in Blood Red Malta orchards during 2009-10 revealed that all leaf samples were found deficient in nitrogen content, high in phosphorous content and low in potassium. The micro-nutrient analysis of Malta leaves showed sufficiency of iron and copper content, low in manganese and zinc content. The physico-chemical analysis of Malta fruits revealed that excellent Malta production can be achieved in arid soils of Bikaner district with proper management of nutrients at both macro and micro level and harvesting of fruits in the December-January can provide remunerative returns to fruit growers in the canal command areas of Bikaner district.

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6. Effect of Cytokinin and Auxin on Callus Formation and Shoot Multiplication of Strawberry (*Fragaria* × *ananassa* Duch.) under *in vitro* Condition

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ABSTRACT : The experiment was pursued in Tissue Culture Laboratory of Department of Horticulture in Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut during 2015-16 on Chandler variety of strawberry. N_6 media were prepared. Maximum callus formation in mature leaf explant (81%) was noted under the treatment of BAP 2mgl^{-1} combined with IBA 1.0 mgl^{-1}. Maximum callus formation in young leaf (74.0%) was noted under the treatment of BAP 2mgl^{-1} combined with IBA 1.0mgl^{-1}.Maximum callus induction in internode (47.6%) was noted under the treatment of BAP 2mgl^{-1} combined with IBA 1.0 mgl^{-1} . Highest number of shoots (14.00) from mature derived callus at four weeks after inoculation were noted under the treatment of BAP 2mgl^{-1}+ Kinetin 1.5 mgl^{-1}. Maximum number of shoots (11.66) from young leaf derived callus of strawberry cv Chandler at four weeks after inoculation were noted under BAP 2mgl^{-1} combined with Kinetin 1.5 mgl^{-1} and BAP 3mgl^{-1} alone. The highest number of shoots (10.33) from internode derived callus at four weeks after inoculation were noted with BAP 3mgl^{-1} alone. Viewing above observations it is concluded that BAP 2 mgl^{-1} + IBA 1.5 mgl^{-1} and Kinetin 1.5 mgl^{-1} + IBA 1.0mgl^{-1} showed better performance on accordance of callus formation in mature leaf, young leaf as well as internode. BAP 2 mgl^{-1} + Kinetin 2mgl^{-1} showed better performance on accordance of shoot induction in mature leaf, young leaf as well as internode.

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7. Genetics of Yield and its Component in Ash Gourd {*Benincasa hispida (Thunb.) Cogn.*}

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ABSTRACT : An experiment was conducted to study the pattern of inheritance of vine length, fruits per plant, fruit weight and yield per plant from six generations (P_1, P_2, F_1, F_2, B_1 and B_2) means of ten crosses obtained by crossing nine inbred in ash gourd. Majority of the crosses indicated the contribution of dominance gene effects and duplicate epistasis. Among epistasis interactions, addictive x additive (i) played a significant role for vine length, fruits per plant and fruit weight, while additive × additive (i) and dominance × dominance (1) contributed towards fruit yield. These results suggest that heterosis breeding might be more effective for speedy improvement of this crop.

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8. Effect of Silicon Bunch Spraying and Bunch Bagging on Fruit Yield, Quality and Shelf Life of 'Neypoovan' Banana

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ABSTRACT : An experiment was conducted to know the effect of bunch spraying of silicon and bunch bagging on fruit yield, quality and shelf life of banana cv. Neypoovan. Potassium silicate was applied as three sprays at 30 days interval after emergence of inflorescence followed of bagging of bunches. Sprays were given at concentration of 2.0, 4.0 and 6.0 ml/lit per bunch 30 days interval then followed by bagging of bunches with polyethylene sleeves after spraying till harvest of fruits. Fruit characters like fruit weight, fruit length, fruit diameter, bunch weight and maximum shelf life (7.33 days) was recorded in treatment applied with bunch spraying of potassium silicate 6 ml/l per bunch bagging. The quality parameters viz., total sugars, acidity, total soluble solids, starch content of the fruit were also significantly influenced by same treatment.

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9. Physico-chemical characterization of guava cultivars under Sawai Madhopur conditions of Rajasthan

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ABSTRACT : Based on cumulative assessment of the characters studied during survey of guava orchards in Sawai Madhopur district during 2014-15, it appeared that Gola (Barfkhan) is better over L-49 and Allahabad Safeda with respect to fruit weight, size, thickness of flesh, weight of pure flesh excluding seed cavity, soft texture of seeds, ascorbic acid contents and TSS content which are marketing traits for the guava varieties. In this variety maximum fruit weight (375.87g) and equatorial diameter (82.89 mm) was recorded. This variety had maximum yield of 1.0-1.5 q/tree which was 0.80 and 0.60 q/tree in case of L-49 and Allahabad Safeda, respectively. Gola (Barfkhan) variety's fruit was crunchy in texture with soft seeds. Spreading growth behaviour, compact canopy, green leaf luster and solitary bearing habit were other features of this variety.

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10. Genetic Variability, Heritability and Genetic Advance in Grapefruit (*Citrus paradisi*) Genotypes

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ABSTRACT : Variability assessment of six grapefruit varieties was done based on 22 qualitative and quantitative morphological characters. The maximum variability was observed for leaf lamina width (CV = 12.03), while the minimum variability was noted for petiole wing width (CV = 0.13). The maximum heritability (h^2) coupled with maximum genetic advance percentage of mean (GA) was observed for petiole wing width (100 and 45.96, respectively), followed by spine length (100 and 25, respectively) and rootstock diameter (85 and 21.44, respectively), while the minimum heritability coupled with the minimum genetic advance percentage of mean was observed for leaf lamina length (7 and 0.70, respectively).

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11. Effect of Inorganic and Organic Manures on Growth, Yield and Quality of Onion cv. 'Pusa Madhvi' Under Valley Condition of Garhwal Himalaya

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ABSTRACT : An experiment was conducted to find out the combined effect of inorganic fertilizers (NPK) and organic manures [vermicompost, poultry manure and farm yard manure (FYM)] on growth, yield and quality of onion cv. Pusa Madhvi in a Randomized Block Design with three replications. The results showed that maximum plant height (73.18 cm), leaf length (56.10 cm), leaf width (4.51 cm), root length (8.02 cm), fresh weight of leaves (55.27 g) and dry weight of leaves (19.61 g) was recorded under the [Recommended dose of fertilizers (RDF) 75% + poultry manure 25%]. While the neck length (5.08 cm), neck diameter (2.04), total sugar (6.60) and specific gravity (1.47) was recorded maximum in T_1 (RDF 100%). The maximum number of leaves (13.60), number of roots/ plant (159.40), bulb diameter (6.59 cm), fresh weight of bulb (159.79 g), number of scale/ bulb (6.56), yield/ hectare (41.88 q) and Vit- C (17.27) was recorded highest under T_3 (RDF 75% + vermicompost 25%). The fresh weight of root (4.24 g) and dry weight of root (2.02 g) was recorded maximum in T_{10} (RDF 50% + FYM 50%). Therefore, T_3 (RDF 75% + vermicompost 25%) treatment combination was adjudged best for onion cultivation under valley conditions.

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12. Effect of INM Practices in *Rauwolfia tetraphylla* in Assam Condition

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ABSTRACT : An experiment was carried out in the medicinal and aromatic plant block of Experimental Farm (Horticulture), Department of Horticulture, College of Agriculture, Assam Agricultural University, Jorhat during

2010-2011 and 2011-12. The experiment was laid out in Randomized Block Design with seven treatments *viz,* T_0 = control, T_1 = 100% RF + FYM 5t/ha (RF: reference dose of fertilizer @ 10 : 60 : 30 kg/ha N, P_2O_5 and K_2O, T_2 = 75% RF + *Azotobacter* @20 g per plant + PSB @20 g per plant + FYM 5t/ha, T_3 = 50% RF+ *Azotobacter* @20 g per plant + PSB @20 g per plant + FYM 5t/ha, T_4 = 25% RF+ *Azotobacter* @20 g per plant + PSB @20 g per plant + FYM 5t/ha, T_5 = 50% RF + FYM 5t/ha + Vermicompost 1t/ha, T_6 = 50% RF + FYM 5t/ha + Enrich compost @2t/ha (AAU made) and three replications for two years to determine the biometric and yield performance of *Rauwolfia tetraphylla* under different nutrient sources. The soil of the experimental plot was sandy loam having pH of 4.8, organic carbon (10.05 %), available N (243.32 kg/ha), available P_2O_5 (24.98 kg/ha) and available K_2O (94.75 kg/ha). The maximum value of plant height (89.15 cm), leaf number (374.70), leaf area index (2.62), branches (19.09), flowers (372.54) and fruits per plant (295.09), seed and root yield (8.94kg/ha and 2809.64kg/ha) were recorded under treatment T_2. The highest value of total alkaloid (1.28mg/100g dry weight), Phenol(1.69mg/100g dry weight), Tannin (0.45mg/100g dry weight) and Flavonoids (1.70mg/100g dry weight) were recorded by the treatment receiving vermicompost in combination with 50% RF dose of fertilizer and organic manures (T_5).

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13. Effect of IBA on Vegetative Growth and Multiplication Rate in Stem Cuttings of Pear Rootstocks

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ABSTRACT : The present investigation was carried out in order to standardize the optimum IBA concentration for vegetative propagation of pear rootstocks Quince-C and BA-29 with reference to vegetative growth and multiplication rate, they were given different concentration of IBA. The treatment with IBA significantly influenced the parameters under study. The IBA treatment @ 1000 ppm was found to be the best in terms of most of the vegetative growth parameters and multiplication rate. The highest multiplication rate was achieved on Quince-C treated with 1000 ppm IBA. Study concluded that IBA treatments significantly influenced vegetative growth and multiplication rate in stem cuttings of pear rootstocks.

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14. Effect of GA_3 and *Azotobacter* on Growth and Flowering in African Marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gainda

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ABSTRACT : The field experiment was conducted at Horticulture Research Farm of Choudhary Charan Singh University Campus, Meerut U.P. during 2011-12. The nine treatments A_1 (Azotobacter by Root Treatment 0.20g/15 plants), A_2 (*Azotobacter* by Soil Treatment 0.40g/plot), G_1 (Gibberellic acid 100 ppm spray at 30 DAT), G_2 (Gibberellic acid 150 ppm spray at 30 DAT), A_1G_1 (*Azotobacter* by Root Treatment 0.20g/15 plants and Gibberellic acid 100 ppm spray at 30 DAT), A_1G_2 (*Azotobacter* by Root Treatment 0.20g/15 plants and Gibberellic acid 150 ppm spray at 30 DAT), A_2G_1 (*Azotobacter* by Soil Treatment 0.40g/plot and Gibberellic acid 100 ppm spray at 30 DAT), A_2G_2 (*Azotobacter* by Soil Treatment 0.40g/plot and Gibberellic acid 150 ppm spray at 30 DAT) and A_0G_0 (No *Azotobactor* and No Gibbrellic acid) were evaluated in Randomized Block Design with three replications. The experimental finding revealed that the treatment A_2G_2 (Soil treatment with *Azotobacter* + Spray of GA_3 @ 150 ppm) gave the maximum plant height, maximum number of primary branches per plant, maximum number of secondary branches per plant, maximum plant spread, minimum number of days taken for flower bud appearance, maximum number of flowers per plant, maximum flower diameter, maximum fresh weight of flowers per plant and maximum yield of flower in comparison to individual application of GA_3 and *Azotobacter*.

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15. Effect of Seedling age on Growth and Flowering Attributes of Tomato (*Lycopersicon esculentum* Mill.)

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ABSTRACT : The experiment was conducted at the Department of Horticulture, C.S.A.University of Agriculture and Technology, Kanpur during the year 2014-15 to find out effect of seedling age on growth and flowering attributes of tomato (*Lycopersicon esculentum* Mill.).Randomized block design (RBD) was used with eight treatments of seedling age *i.e.,* T_1 (16 days), T_2 (20 days), T_3 (24 days), T_4 (28 days), T_5 (32 days), T_6 (36 days), T_7 (40 days) and T_8 (44 days) and three replications. Observations were recorded on growth and flowering attributes *i.e.,* height of plant, spread of plant, number of primary branches/plant, number of secondary branches/plant, day to first flower initiation and number of flower per plant. The results showed that T_3 (24 days old seedling) increased significantly to plant height, spread of plant (N-S,E-W), and number of flowers/plant revealing 63.19 cm maximum plant height, maximum plant spread 116.18 cm (N-S) and 171.13 cm (E-S), and maximum number of flower/plant (69.64) respectively. Treatment T_4 (28 days old seedling) enhanced number of primary branches (7.35) which was greater variation among treatments while number of secondary branches were significantly influenced (9.65) with T_4 treatment also. Days to first flower initiation was significantly enhanced with T_1 treatment (62.15 days).

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16. Mango Hopper Management by IPM practices including Insecticides, Botanicals and Cultural Practices

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ABSTRACT : Studies on the effect of IPM, chemical, botanicals and cultural practices on hopper showed that hopper population was effectively controlled in insecticide, IPM, insecticide + botanical pesticide and botanical pesticide whereas maximum hopper population was recorded in control. Fruit set per 100 panicles was significantly higher than control in all treatment whereas it was at par among IPM, insecticide alone and insecticide+botanical pesticide. Fruits harvested were maximum in IPM followed by insecticide and insecticide+botanical pesticide whereas no significant differences in fruits harvest were observed between cultural+ mechanical practices and control. Fruit weight was maximum in IPM followed by insecticide+botanical pesticide and insecticide alone. Lowest fruit weight was observed in control.

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17. Effect of Micro Nutrients and Fungicide Application on Internal Fruit Necrosis, Cracking and Fruit Drop in Bael (*Aegle marmelos* Correa.)

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ABSTRACT : An experiment was conducted at Horticultural Research Centre, SVP university of Agriculture and Technology, Meerut during 2009-10 and 2010-11 to investigate the effect of micro-nutrients and fungicide on internal fruit necrosis, cracking and fruit drop in bael. Out of six treatments applied, combined application of boron (1%) + copper sulphate (0.25%)+ carbendazim (0.1%) was found to be most effective in reducing internal fruit necrosis (17.00% reduction over control), fruit cracking (15.00% reduction over control) and fruit drop (14.70% reduction over control).

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18. High density planting in fruit crops

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ABSTRACT : High density orcharding is one of the recent novel concepts of increasing productivity without affecting quality of fruits. It gives earlier production and return per unit area, shortens juvenility provides efficient resources. Dwarfing root stocks play key role to accommodate more number of plants per unit area. Under HDP has been found most suitable technique for some tropical and subtropical fruits accomodating more number of plants per unit area *viz.,* Dashehari mango (1333 plants/ha), guava (5000 plants/ha), papaya (6400 plants/ha), etc.

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19. Problems faced by kvk training programME on chilli production technology on participating farmers in Khargone District of Madhya Pradesh

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ABSTRACT : Finding of this study that major problems faced by trainees farmers in production technology of chili were problems terms of training program were not organized as the need based training, lack of active worker, lack of irrigation facility, storage and marketing problems, not attending training programe regularly, family norms, non availability of audio-video aid, high cost of input health problem, lack of technical knowledge about improved activities, burden of work, high cost of transpiration distant training centre, low socioeconomic status and illiteracy.

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2. Johnson, D.A. (1940). *Plant Microtechnique*. McGraw- Hill Publishing Co. Ltd., New York. PP-29

3. Kapil, R.N. and Arora, S. (1990). Some fascinating features of orchid pollen. *J. Orchid Soc.*, **4** (1): 9-28.

4. Rashid, S., Ashraf, M., Bibi, S. and Anjum, R. (2000). Antibacterial and antifungal activities of *Launaea nudicaulis* Roxb. and *Launaea resedifolia* L. *Pakistan J. Biol. Sci.*, **3** (4) :630-632.

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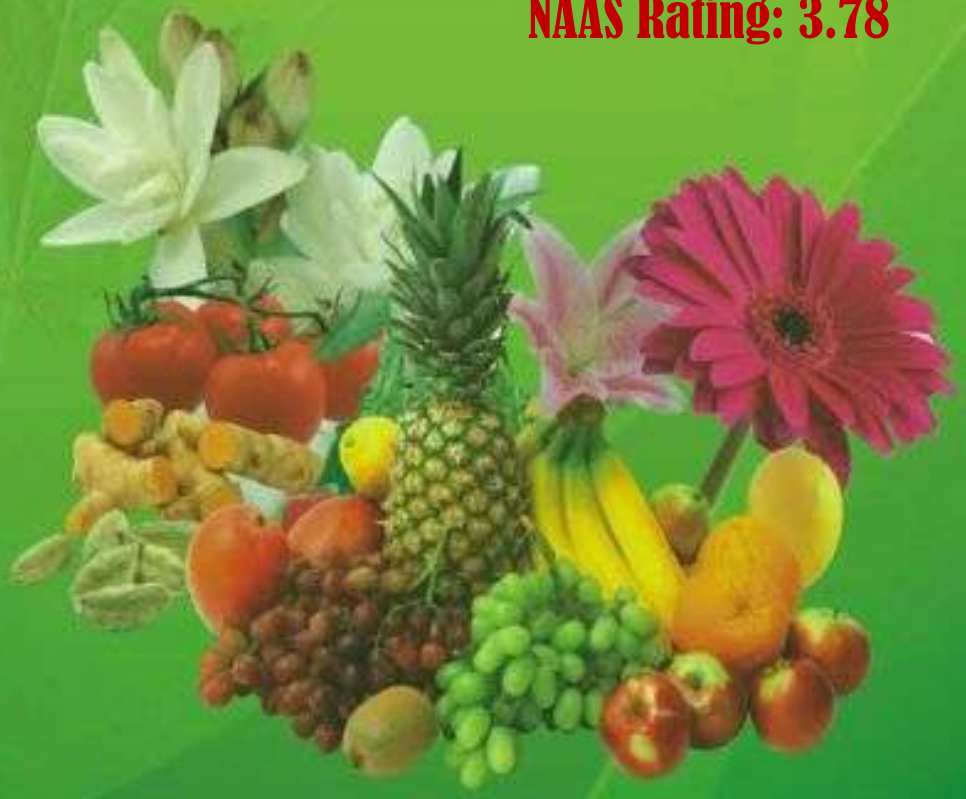

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ABSTRACTS

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1. Phenology of Leaf, Flower and Fruits of *Boswellia neglecta* and *Commiphora myrrha* in Borena Zone, South Eastern Ethiopia

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ABSTRACT : Leafing, flowering and fruiting phenology patterns of *C.myrrha* and *B.neglecta* were examined in Borena Zone of Oromiya region, South Eastern Ethiopia, for the period of 24 months starting from September, 2011 to September, 2013. We selected 16 individual trees (Dbh ≥ 10 cm) of both species at 100m apart and monitored in every week for phenologies.The result revealed that pattern of leafing and leaf loss, flowering and fruiting are bimodal following the rainfall pattern of the study area. Leaf flushing starts in the month of September and March when wet season begin for both species. And flushing reached peak and trees covered with leaf in the months of October to November and April to May in the first and second seasons, respectively. Leaf shedding starts in mid-December and mid-June. Flowering is concentrated in December and June and usually ends (Dried and withered) at the mid of January and July. Early fruiting observed in October for *C. myrrha* and in Novemberfor *B.neglecta* in the first season and in July for both species in the second season. However, fruit maturation was in November and July for *C.myrrha* and January and July for *B.neglecta*. According to the local people and monitoring of the trees, seed harvesting is possible before end of January for *C.myrrha* and mid-February for *B.neglecta* since fruiting of both species in the second season is not certain.

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2. Sediment Outflow from Paddy Mulch at Varying Land Slopes under Simulated Rainfall Conditions

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ABSTRACT : Soil erosion in India is really need of hour as to improve soil health is on main agenda. Various measures are used by researchers to reduce soil loss due to runoff and best one is found to be biological measures. In biological measures, organic mulches are very effective in preventing soil erosion, to reduce sediment transport rate, runoff and increasing infiltration. The study was carried out with the objectives to observe the sediment outflow during paddy mulch treatments at selected land slopes with different rainfall intensities under simulated rainfall conditions, just to count soil loss. The quantity of mulch was taken as, 6 ton/ha, 8 ton/ha and 10 ton/ha and for each mulch treatment, three rainfall intensities *viz.* 11cm/h, 13cm/h and 14.65cm/h at 0%, 2% and 4% land slopes were selected. The average sediment concentration and outflow was found to be increasing with the increase in land slope, but sediment concentration and outflow decreased with increasing mulch rate for particular land slope and rainfall intensity. The sediment outflow rate for no mulch treated land was higher as compared to paddy straw mulch treated lands. Mathematical relationships were developed for relating sediment outflow rate, sediment concentration, land slope and rainfall intensity for a particular mulch treatment. It was observed that values of sediment outflow rate and average sediment concentration had a good correlation with rainfall intensity and land slope for each mulch treatment. The correlation coefficients of developed models were found to be more than 90% which supports mulching as the best biological measure.

Published in : HortFlora Research Spectrum, 5 (4) : 275-283 (December 2016)

3. Response of Tomato (*Lycopersicon esculentum* Mill.) Cultivars to Differnt Levels of Saline Irrigation Water

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ABSTRACT : The present study aspired to evaluate some tomato cultivars under different levels of saline irrigation water under poly house. Six widely cultivated varieties *viz.,* Gujarat Tomato^{-1}, Junagadh Tomato-3, Coimbatore-3, Arka Vikas, Pusa Ruby and Pusa Early Dwarf were evaluated. The study outcome expressed a relation that consistent decrease in growth with increase salt concentration in saline irrigation water. About fifty per cent decrease in growth, flower and yield parameters was observed at 5.0 dSm^{-1} level of saline irrigation water. The quality of fruits (TSS, Ascorbic acid, Acidity, Reducing sugar, Total sugar and Proline) was increased with increasing salt concentration in saline irrigation water. Pusa Ruby and Junagadh Tomato-3 gave better response with increased salt levels in irrigation water. The variety Pusa Ruby gave maximum plant height (155.25 cm) and number of branches (30.92) per plant and variety Junagadh Tomato-3 gave highest yield and quality parameters with different levels of saline irrigation water.

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4. Effect of Drying Techniques and Embedding Media on Dried Flower Quality of Rose (*Rosa chinensis* Jacq.) and Water Lily (*Nymphaea alba* L.)

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ABSTRACT : An investigation was conducted to study the effect of drying techniques and embedding media on dried flower quality of rose (*Rosa chinensis* Jacq.) and water lily (*Nymphaea alba* L.) at the College of Horticulture & Forestry, Jhalawar (Raj.), comprising of 22 treatments including three drying conditions *viz.* air drying without embedding (control), hot air oven drying (At 40°C, 50°C and 60°C for 24 hours) and microwave oven drying (2 minutes, 3 minutes and 4 minutes at 350 Hz) in a combination with three different embedding media *viz.* sand, borax and silica gel. The experiment was laid out in completely randomized design (CRD) with three replications. The largest sized dried flowers (5.91 cm in rose and 10.00 cm in water lily) were recorded in microwave oven drying at 350 Hz for 2 minutes plus sand embedding. The maximum weight loss (86.78 % in rose and 88.71 % in water lily) was recorded in Microwave oven drying at 350 Hz for 4 minutes plus silica gel embedding. The minimum pigment loss in dried flowers of rose (20.27 %) was recorded in microwave oven at 350 Hz for 2 minutes plus embedding. The highest sensory scores for colour (8.13 and 7.95), shape (8.57 and 7.87) and overall acceptability (8.23 and 7.90) of dried flowers of rose and water lily, respectively were recorded with silica gel embedded flowers dried in microwave oven at 350 Hz for 3 minutes as against the lowest scores for colour (5.08 and 5.01), shape (5.04 and 4.93) and overall acceptability (5.01 and 4.97) of dried flowers of rose and water lily, respectively recorded with control (air drying without embedding).

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5. Evaluation of Strawberry (*Fragaria* × *ananassa* Duch.) Cultivars for Fruit Quality and Biochemical Characters under North-western Plains of India

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ABSTRACT : The present investigation was conducted on “Evaluation of strawberry (*Fragaria* × *anasassa* Duch.) cultivars under sub tropical conditions of Punjab”. The objectives of this study was to evaluate ten strawberry cultivars *viz.* ‘Chandler’, ‘Camarosa’, ‘Sweet Charlie’, ‘Antana’, ‘Ofra’, ‘Gorella’, ‘Brighten’, ‘Catispill’, ‘Elaranthra’ and ‘Belrubi’ for their yield and quality characters. The variability among different cultivars was evaluated on fruiting and biochemical characters. The significant variability was found for these characters among various cultivars. Cultivar Camarosa took maximum days to fruit set and maximum days

taken upto fruit maturity was recorded in cultivar brighten. Harvesting period was early in Sweet Charlie and late in Camarosa and Chandler. The fruit length and breadth was maximum in Camarosa and Chandler. Number of flowers/plant was maximum in Antana and Catispill while the fruit weight, fruit yield/plant and fruit yield/acre was maximum in Chandler and Camarosa. Maximum TSS and TSS/acid ratio was recorded in Sweet Charlie, highest acidity was found in Gorella and maximum total sugars in Camarosa. Highest vitamin C and anthocyanin was recorded in Ofra and Sweet Charlie, respectively.

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6. Evaluation of Production Potential of Subtropical Mango under Degraded Lands in Foothills of Uttarakhand

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ABSTRACT : A trial was conducted on 5 years old subtropical mango cultivars (T_1 = Amrapali, T_2 = Mallika, T_3 = Dashehari, T_4 = Langra, T_5 = Bombay green (BG) and T_6 = Ramkela) during 2000-2014 at Research Farm, Selakui, ICAR-Indian Institute of Soil and Water Conservation (ICAR-IISWC), Dehradun. Mango cultivars were planted in the randomized block design (RBD) with three replications to assess performance on non-arable lands in the subtropical zone of Uttarakhand, India. Data revealed that Mallika cultivar of mango recorded maximum canopy spread (5.85 m), produced highest fruit yield (9.85 tha^{-1}) followed by Amrapali and Dashehari, Langra, Bombay Green and lowest fruit yield in Ramkela. Similarly, Mallika also produced maximum carbon stock in the plant body (25.45 Mg ha^{-1}) and sequestered maximum atmospheric carbon dioxide (93.15 Mg ha^{-1}) followed by Dashehari, Langra and minimum with Amrapali. Economic returns were also recorded maximum with Mallika followed by Amrapali, Dashehari, Langra and minimum with Ramkela. Hence, Mallika followed by Amrapali / Dashehari is recommended for economic returns, productivity, carbon sequestration and rehabilitation of degraded lands in the foothills of Uttrakahnd.

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7. *In silico* Identification and Characterization of Potential miRNAs From *Capsicum annuum*

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ABSTRACT : Recently, MicroRNAs (miRNAs) have been shown to be important regulator of genes in many organisms and have been implicated in a growing number of diseases. MiRNA are ~22 nt sequences. *C. annuum* is a well known plant in the world. A total of 1,18,578 Expressed Sequence Tags (EST) of *C. annuum* were mined from database of EST's (dbEST) and processed through Seqclean, 490 sequences were trashed and rest of 1,18,088 sequences were masked through RepeatMasker. Contigs were obtained by processing masked sequences through TGICL. A total no. of 25 putative microRNA's with significant similarity with the plant miRNA of closely related species of *C. annuum*. Majority of the predicted miRNAs were of 24, 23 and 22 nucleotides in length. The potential target of these miRNAs were miRNAs encoding enzymes regulating essential plant metabolic pathways including the putative transcription factor, oxygenases, disease resistance proteins, wound-responsive family protein, early E3 ubiquitin ligase, Rho binding family proteins and mostly are related to the responses to the biotic stresses and stress signaling in plants

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8. Effect of Hoagland Solution for Growing Tomato Hydroponically in Greenhouse

Harmanpreet Kaur, Rakesh Sharda and Pankaj Sharma*
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ABSTRACT : The present study was done to evaluate the effect of Hoagland solution for growing tomato hydroponically in greenhouse. The experiment was carried out in fan pad cooled greenhouse, using substrate with cocopeat, perlite and vermiculite (3:1:1 v/v). A NFT was developed for hydroponically grown tomatoes to supply nutrient solution to plants placed in net pots in PVC pipes. The experiment consists of 3 replications and 3 treatments. Nutrient solution was placed in 100L of tank. There were 9 tanks for the experiment. Three kinds of nutrient solution were used for each replication: 1) Hoagland solution at 100% concentration as treatment 1; 2) Hoagland solution at 75% concentration as treatment 2 and 3) Hoagland solution at 50% concentration as treatment 3. Plant growth, total fruit yield, TSS (total soluble solids) and titrable acidity were higher in Hoagland solution at 100% concentration than the others, but there was no significant difference between the three solutions in terms of diameter of stem, moisture content, firmness and lycopene. The result showed that Hoagland solution at 100% concentration increased the height of plants as well as total fruit production including fruit quality i.e. TSS and titrable acidity. Cost analysis for the hydroponic system was also done.

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9. Growth Pattern and Biochemical Dynamics of Acid Lime cv. Kagzi in Jhalawar District

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ABSTRACT : Acid lime fruits are a matter of research because of its importance to agriculture and human diet. It is highly valued for its medicinal value. Acid lime (*Citrus aurantifolia* Swingle.) is one of the most important commercial citrus cultivars al and nutritive value irrespective of its economic significance in its daily use as well as in pickle industry. Acid lime fruit growth follows smooth sigmoidal type during fruit development. The patterns of fruit growth and changes in biochemical quality parameters were assessed at 15 days interval from fruit set to maturity. The fruits attained maturity in 120 days after fruit set when skin colour changed from green to yellowish green. There was a continuous increase in fruit size throughout the growth phase. At maturity, fruit weight reaches a peak of 97.85g and fruit juice recovery was 57.91%. The peel thickness and peel % decreased with progressive increase till it reaches full maturity; while pulp% and pulp to peel ratio showed an ascending trend with maturity. The value of specific gravity at peak maturity was 0.98. Based on the characteristics of different indexes, TSS and TSS/TA ratio revealed advancing trend with advancing maturity and reached the steady status during 105-120 days after fruit set.

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10. Effect of Environment Conditions (pH, Temperature and Media) on Radial Growth of Oyster Mushroom (*Pleurotus djamor*)

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ABSTRACT : In India, oyster mushrooms are particularly interesting as one kind of popular foods. The present study was conducted with the aim of finding out the most favourable temperature, pH and different media on radial growth rate were assessed on potato dextrose agar medium (PDA). Study was carried out to check the effect of temperature (23 - 28°C), pH (6.9 - 8.1) and different media (Potato dextrose agar, Chickpea extract agar, Pigeon pea extract agar, Barley extract, Black gram extract agar, and Oat extract agar) on the radial

growth of *Pleurotus djamor*. Optimum temperature and pH for growth was 28°C and 7.5, respectively. Maximum radial growth was observed when Barley extract agar was used as media.

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11. Optimization of Irrigation Strategies for Higher Biomass and Fruit Production in Kinnow Mandarin of Lower Himalaya

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ABSTRACT : The experiment on Kinnow mandarin was laid out in split-plot design with four replications. The treatments comprised of four frequencies of irrigation based on net CPE (CPE-RF) *i.e.* at I_1 = 80 mm, I_2 = 120 mm, I_3 = 160 mm and I_4 = 240 mm in the main plots and two types of organic mulches *viz.* M_1 = Sal (*Shorea robusta*) and M_2 = Lantana (*Lantana camara*) leaves in addition to control (without mulch) in the sub-plots. The tree volume, biomass production, carbon sequestration, fruit yield and physico-chemical properties of Kinnow mandarin were improved significantly with irrigation treatments in order of $I_1 > I_2 > I_3 > I_4$ and mulch did not influenced significantly. The tree volume of Kinnow was recorded maximum (78.94 m^3) with I_1 treatment as 67.5, 26.71 and 12.56 per cent more over I_4, I_3 and I_2 treatments of irrigation, respectively, which was positively correlated with carbon storage, carbon sequestration and fruit yield in the tree. The highest carbon stock of Kinnow (30.0 Mg/ha) followed by 28.7, 27.4 and 25.2 Mg/ha under different irrigation frequencies, respectively. Maximum fruit yield was recorded (83.30 kg/tree) with I_1 treatment was 76.56, 27.62 and 11.95 per cent more over I4, I3 and I2 treatments, respectively. Kinnow fruit plants raised with M_1 treatment produced 4.94 and 16.02 per cent more fruits than M_2 and M_3 treatment, respectively besides improving the microclimate. The study indicates that irrigation and mulching have positive response on Kinnow mandarin in Doon Valley. Therefore, 75 m^3 water per plant with mulch is optimum is recommended for carbon dioxide mitigation and fruit production in Kinnow mandarin in sandy loam soils.

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12. Prospects and Potential of Custard Apple in Rajasthan

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ABSTRACT : Rajasthan state of India holds promise in availability of germplasm of custard apple belonging to genus *Annona* in Mewar and Hadoti regions comprising of Udaipur, Chittorgarh, Baran and Jhalawar districts. Custard apple exists in the form of landraces. The tribal people harvest them and sale in the local markets. There exists a lot of scope to identify best one amongst wild germplasm available in plenty. Selection may be made against early bearing, synchronous maturity of sexes, poor fruit setting, freeness from mummification, soft and mealy texture, fruit size, shelf life besides ravages to pests and diseases. Horticultural interventions are the need of hour to really harvest the food and nutritional values of the fruit. There is a great need to preserve existing biodiversity of custard apple in the state with sustainable efforts being needed to enhance production, accelerate research and develop capabilities to make custard apple as profitable farming enterprise amongst fruit growers of the Rajasthan state.

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13. Vase life and Quality of Spray Chrysanthemum (*Dendranthema grandiflora* 'Tzevlev') as Influenced by Floral Preservatives

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ABSTRACT : An experiment was conducted to study the effect of floral preservatives on the vase life and quality of chrysanthemum. The seven treatments *viz.,* T_1 ($AgNO_3$: 75ml + Sucrose : 75ml), T_2 ($AgNO_3$: 50ml + 8-HQC 50ml + Sucrose: 50ml), T_3 (8-HQC : 75ml + Sucrose : 75ml), T_4 (8-HQC : 150ml), T_5 ($AgNO_3$:150ml), T_6 (Sucrose : 150ml), T_7 (Control- Distilled water : 150ml) were evaluated in Completely Randomized Design with three replications with 21 cut stems. The experimental findings revealed that the treatment T_1 ($AgNO_3$ + Sucrose) was most effective for maximum increasing in fresh weight on 3rd and 6th day, minimum reduction in fresh weight at senescence day, maximum solution uptake on 3rd day and at senescence day, maximum bud opening % on 9th day and observed maximum vase-life with this treatment.

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14. Role of Integrated Nutrients Management on Growth, Yield and Quality of Tomato under Garhwal Hills

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ABSTRACT : A field experiment was conducted at Horticulture Research Centre, Chauras Campus, HNB, University, Garhwal, Uttarakhand during Rabi season to find out the effect of integrated nutrients on growth, yield and quality of tomato (*Lycopersion esculantum* Mill.) Cv. Punjab Chhuhara. The experiment was laid out in randomized block design with three replications. The experiment consist of twelve treatments *viz.,* NPK 100% (T_1), NPK 50% (T_2), F.Y.M (T_3), Vermicompost (T_4), *Azotobactor* (T_5), NPK 100% + F.Y.M (T_6), NPK 100% + Vermicompost (T_7), NPK 100% + *Azotobactor* (T_8), NPK 50% + F.Y.M (T_9), NPK 50% + Vermicompost (T_{10}), NPK50% + *Azotobactor* (T_{11}) with Control (T_{12}). Results were found to be significant for all the growth, yield and quality characters under combined use of organic, inorganic and biofertilizer. Plant height (83.12 cm), leaf area (219.12 cm^2), branch/plant (8.23), leaf/branch (18.59), cluster/plant (13.83), fruit/cluster (4.36), T.S.S (5.82 °Brix) and ascorbic acid (28.16 mg/100g) were maximum in T_8 (NPK 100% + *Azotobactor*), while minimum in T_{12} (Control). Whereas, fruit size (6.38 cm), fruit weight (119.32 g), fruit yield/plant (1.83 kg), yield/ha (285 q) were highest in T_7 (NPK 100% + Vermicompost), while minimum in T_{12} (Control). The results clearly indicated that T_7 (NPK 100% + Vermicompost) and T_8 (NPK 100% + *Azotobactor*) is most effective to improve the growth, yield and quality of tomato compression to other treatments.

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15. Gene Effects for Qualitative Trait using Three Testers in Tomato (*Lycopersicon esculentum* Mill.)

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ABSTRACT : Three testers, BT-17 and PS-1 and there hybrid (BT-17 × PS-1) were crossed to 15 inbred lines to develop the experimental material The modified triple test-cross analysis was applied to estimate additive (D), dominance (H) and epistatic component of genetic variance for ten quantitative traits of tomato.. Overall epistasis was important for number of seeds/fruit and number of locules/fruit for both the season except number of seeds/fruit in spring-summer season Significant estimate of both additive and dominance component were observed for all the characters except total soluble solids in both the season for additive and total soluble solids in autumn-winter season for dominant component. The F value was positive and significant for total soluble solids in autumn-winter season showing isodirectional nature of dominance. Significant of additive components and F parameter showing increasing effect on the characters, indicates that pedidree selection would be effective for improvement of such traits.

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16. Combined Effect of Organic Manures and Bio-fertilizers on Growth and Yield of Broccoli under Garhwal Himalayan Region

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ABSTRACT : A field trial was conducted at Horticulture Research Centre, Chauras Campus H.N.B University, Garhwal, Uttarakhand, during October 2014 to February 2015 to study the growth and yield potential of broccoli influenced by combined effect of organic manures and bio-fertilizer under Garhwal Himalayan region. The experiment was laid out in randomized block design with three replications. The experiment consist of two organic manures and biofertlizer with their combinations *viz.,* Vermicompost (T_1), Poultry manures (T_2), *Azotobacter* (T_3), Vermicompost + Poultry manure (T_4), Vermicompost + *Azotobacter* (T_5), Poultry manure + *Azotobacter* (T_6), Vermicompost + Poultry manure + *Azotobacter* (T_7), Control (T_8). All the organic manures were applied at the field before one month of transplanting but *Azotobacter* were applied as root treatment before transplanting. Results were found to be significant in all the growth and yield parameters of broccoli. T_7 (Vermicompost + Poultry manure + *Azotobacter*) showed maximum plant height (57.13 cm), leaf length (48.17 cm), plant spread (56.16 cm^2), days to curd initiation (65.89), days to 50% curd initiation (75.23) and days taken to 50% curd maturity (88.51), where as maximum number of leaves (22.58), curd weight (315.69 g) and yield/ha (120.12 q) recorded in T_6 (Poultry manure + *Azotobacter*), while minimum under T_8 (Control). The results showed that the combined use of organic and bio-fertilizer significantly effective on growth and yield characters.

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